OPTIMATION INC.

GENERAL ELECTRIC COMPANY
RECEIVED

INSTRUCTION MANUAL

MODEL AC-160

PRECISION
AC WATTMETER
CALIBRATOR

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SECTION V

CALIBRATION

5-1. GENERAL.

5-2. Complete calibration instructions for the Model AC-160 are given in this section of the manual. The following procedures will calibrate the Wattmeter Calibration System to the performance specified in table 1-1. It is suggested that the instruments only be calibrated when after completing the CHECK steps it is determined that calibration adjustments are necessary.

5-3. CALIBRATION FREQUENCY.

5-4. The Model AC-160 should be checked and calibrated if necessary every 90 days of operation to insure proper performance when the Wattmeter Calibration System is being used as a standard for calibrating and testing power measuring instruments.

5-5. TEST EQUIPMENT REQUIRED.

5-6. The test instruments required to complete these procedures are listed below. The specifications given for each instrument are the minimum required and should alternate instruments be substituted they must meet or exceed these specifications.

1. DC VOLTMETER.- Range: 1.0 to 1.5 volts full scale. It must provide a high degree of AC signal isolation. Example: Universal Avometer Model 8.

2. PRECISION AC VOLTMETER.- Accuracy: better than 0.05%; Resolution: 100 microvolts; Range: 0 to 600 volts rms. Example: Fluke Model 931AB AC Differential Voltmeter.

3. DIGITAL RECIPROCAL COUNTER.- Accuracy: 1×10^{-5}; Resolution: 6 digits; Frequency range: 25 to 10,000 Hertz. Example: General Radio Type 1159.

5. OSCILLOSCOPE.- Frequency range: DC to 10,000 Hertz; Accuracy: 3%; Sensitivity: 1.0 mV per centimeter. Example: Tektronix Model 561B w/10:1 Attenuation Probe.

6. VARIABLE AUTOTRANSFORMER.- Range: 103 to 127 volts rms. Example: General Radio Type W10MT3W (includes voltmeter).

5-7. CALIBRATION PROCEDURE.

5-8. GENERAL. The calibration procedures are arranged in a sequence which allows the Model AC-160 to be calibrated with minimum interaction of adjustments. If the measured performance is within the limits defined in the CHECK step, it is recommended that no further adjustments be made. However, if it is necessary to obtain maximum overall performance of the system then each adjustment can be made to the exact setting, even though the measurement falls within the specification limits given in the check step.

5-9. TEST SETUP AND WARM UP. The following steps describe the initial setup to be made before proceeding with the calibration procedures.

1. Remove the Oscillator, Voltage Amplifier and Current Amplifier from the rack mounting cabinet (if supplied) and disconnect all interconnecting cables.

2. Remove the bottom cover from the Oscillator by removing the 9 pan head screws.

3. Place the Oscillator on a convenient insulated working surface.

4. Connect the Autotransformer to a 115 volts AC power source and set the power switch to ON. Set the Autotransformer to exactly 115 volts rms.

5. Connect the AC line cord between the Autotransformer and the Oscillator.

6. Allow the Oscillator to warm up for 1½ hours at 25°C, ±5°C, prior to making calibration measurements or adjustments.

5-10. OSCILLATOR CALIBRATION PROCEDURE.

5-11. +12 VOLTS POWER SUPPLY ADJUSTMENT. The following steps calibrate the +12 volts power supply on the oscillator board (A1A1). The test point is located along the edge of the oscillator board.

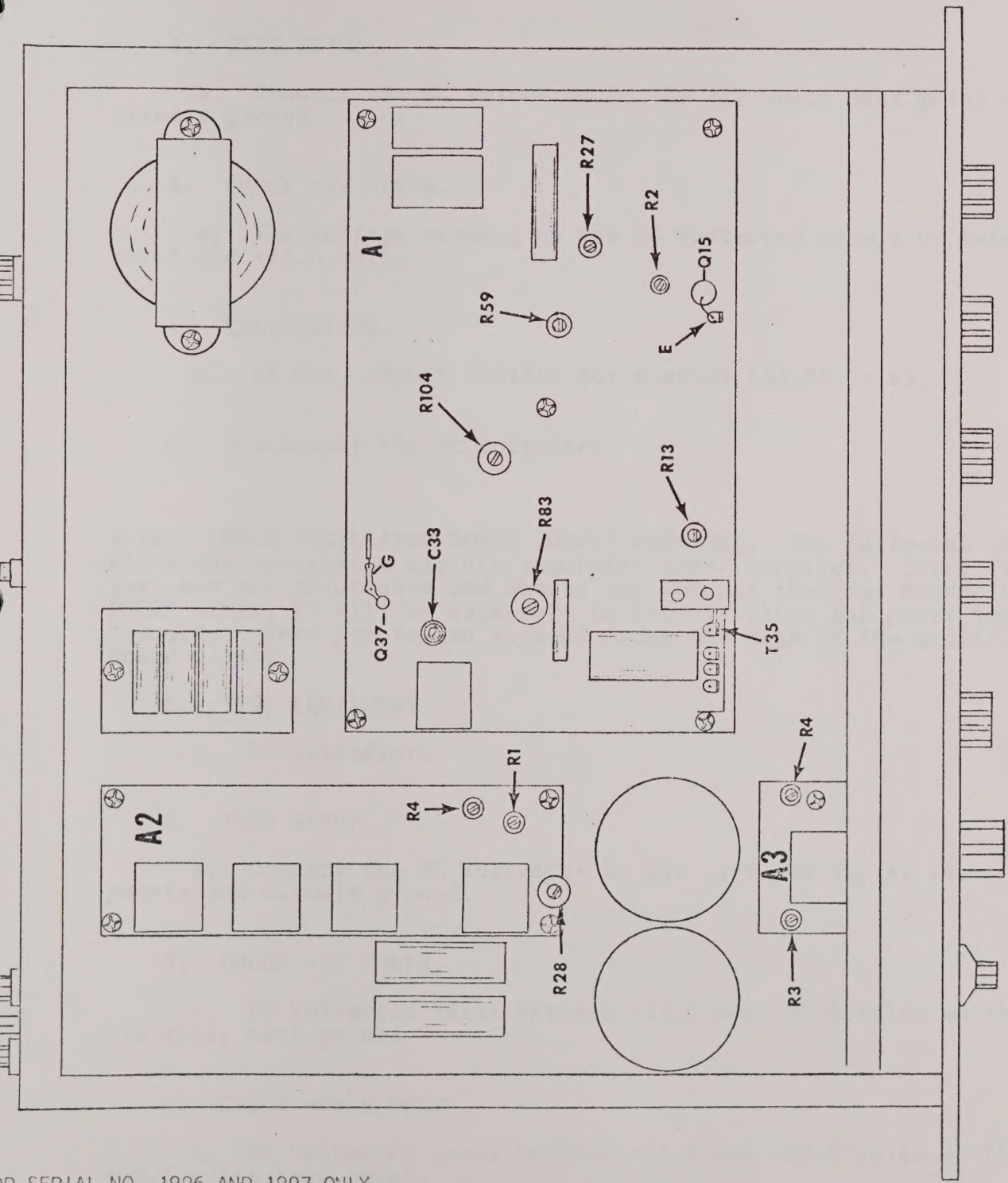

Figure 5-1 Oscillator Adjustments.

OR SERIAL NO. 1996 AND 1997 ONLY.

1. TEST EQUIPMENT.

a. DC Voltmeter.

2. TEST SETUP.

a. Connect the DC Voltmeter to the +12 volts test point and circuit ground.

3. CHECK +12 VOLTS.

a. The voltage reading on the DC Voltmeter should be between +11.4 and +12.6 volts.

4. CALIBRATION.

a. If not, adjust A1A1R59 for exactly +12.00 volts.

5. Disconnect the DC Voltmeter.

5-12. CHECK OSCILLATOR BOARD SUPPLY VOLTAGES. The following steps check the oscillator circuit regulated power supplies. These voltages are not adjustable and should the voltage readings exceed the CHECK steps, it will be necessary to trouble shoot the power supply circuits. Test points are located along the edge of the oscillator board (A1A1).

1. TEST EQUIPMENT.

a. DC Voltmeter.

2. TEST SETUP.

a. Connect the DC Voltmeter to the -12V and +53.8V test points and circuit ground.

3. CHECK -12 VOLTS.

a. DC Voltmeter reads between -11.4 and -12.6 volts on the -12 volts test point.

4. CHECK +53.8 VOLTS.

a. DC Voltmeter reads between +51.0 and +56.5 volts on the +53.8 volts test point.

5. Disconnect the DC Voltmeter.

5-13. CALIBRATE OSCILLATOR CIRCUIT DC BALANCE. The following steps check the DC offset level of the oscillator stage output. Test points and adjustment are located on the rear panel.

1. TEST EQUIPMENT.

a. DC Voltmeter.

2. TEST SETUP.

a. Connect the DC Voltmeter between the DC BAL test points on the rear panel.

3. CHECK.

a. The DC voltage level should be less than ±10 millivolts.

4. CALIBRATION.

a. If not, adjust the DC BAL rear panel screwdriver adjustment (A1R100) for zero volt.

5. Disconnect the DC Voltmeter.

5-13A. QUADRATURE AMPLIFIER DC BALANCE. The following steps calibrate the DC level on the output of the quadrature amplifier stage and oscillator circuits when components have been replaced on the board (A1A1).

NOTE

The following calibration steps need to be performed only if a component(s) has been replaced on the oscillator board (A1A1) or if A1R100 could not be adjusted for zero volt.

1. TEST EQUIPMENT.

a. DC Voltmeter.

2. CHECK QUADRATURE AMPLIFIER DC BALANCE.

a. Connect the DC Voltmeter to the emitter of A1A1Q15.

b. The DC level should be less than ±10 millivolts.

3. CALIBRATION.

a. If not, adjust the rear panel DC BAL screwdriver adjustment (A1R100) for zero volt.

4. CHECK OSCILLATOR CIRCUIT DC BALANCE.

a. Connect the DC Voltmeter between the rear panel DC BAL test points.

b. The DC level should be less than ±10 millivolts.

5. CALIBRATION.

a. If not, adjust A1A1R27 for zero volt.

6. Repeat steps 2 through 5 until both DC balance adjustments are optimized at zero volt.

7. Disconnect the DC Voltmeter..

5-14. CALIBRATE OSCILLATOR STAGE FEEDBACK. The following steps calibrate the positive feedback to the oscillator stage.

1. TEST EQUIPMENT.

a. Oscilloscope.

b. 10:1 Attenuation Probe.

2. TEST SETUP.

a. Set the frequency and DECADE switches to (10)000.0 Hertz.

b. Connect the Oscilloscope using the 10:1 Attenuation Probe to the gate of FET A1A1Q1 (terminal 35). This is shown as T35 on figure 5-1.

3. CALIBRATION.

a. Adjust A1A1R13 for minimum signal level at the gate of Q1.

4. Disconnect the Oscilloscope.

5-15. CALIBRATE SAMPLING PULSE WIDTH. The following steps check the amplitude and calibrate the width of the quadrature sampling pulse.

1. TEST EQUIPMENT.

a. Oscilloscope.

b. 10:1 Attenuation Probe.

2. TEST SETUP.

a. Connect the Oscilloscope using the 10:1 Attenuation Probe to the gate of A1A1Q37. Shown as G on figure 5-1.

b. Set the frequency and DECADE switches to 1000·0 Hertz.

3. CHECK SAMPLING PULSE AMPLITUDE.

a. The pulse amplitude should be greater than 6 volts P-P.

NOTE

No adjustment is provided for the pulse amplitude.

4. CHECK SAMPLING PULSE WIDTH.

a. The pulse width should be 40 microseconds, ±4 microseconds.

5. CALIBRATION.

a. If not, adjust A1A1R83 for a pulse width of exactly 40 microseconds.

6. Disconnect the Oscilloscope.

5-16. CALIBRATE SAMPLING PULSE POSITION. The following steps calibrate the position of the sampling pulse so that it is coincident with the negative peak of the oscillator signal.

1. TEST EQUIPMENT.

a. Precision AC Voltmeter.

2. TEST SETUP.

a. Connect the Precision AC Voltmeter to the rear panel DC BAL test points.

b. Set the frequency and DECADE switches to (10)000·0 Hertz.

c. Adjust the Precision AC Voltmeter for a null (zero differential reading).

3. CALIBRATION.

a. Adjust A1A1R104 for the lowest reading on the Precision AC Voltmeter (i.e., minimum AC output).

4. Disconnect the Precision AC Voltmeter.

5-17. CALIBRATE MODULATOR BIAS. The following steps calibrate the servo amplifier circuit bias.

1. TEST EQUIPMENT.

a. DC Voltmeter.

2. TEST SETUP.

a. Connect the DC Voltmeter

b. Set the frequency and DECADE switches to 1000·0 Hertz.

3. CHECK.

a. The DC Voltmeter should read between 1.0 and 2.0 volts.

4. CALIBRATION.

a. If not, adjust A1A1R2 for 1.5 volts.

5. CHECK FREQUENCY FLATNESS.

a. Check that the DC Voltmeter reads between 1.0 and 2.0 volts when the other two DECADE frequency ranges are selected.

6. Disconnect the DC Voltmeter.

5-18. OUTPUT FREQUENCY CALIBRATION. The following steps determine

if the oscillator is within the output frequency accuracy specifications. If the instrument meets the CHECK step given below it will NOT be necessary to perform the calibration adjustments given in paragraphs 5-19 and 5-20.

1. TEST EQUIPMENT.

a. Digital Reciprocal Counter.

NOTE

If a Digital Frequency Counter is used in place of the Reciprocal Counter it must be used in the PERIOD mode for frequencies of less than 1 kilohertz to obtain better than 0.1% resolution without using time base settings longer than 10 seconds.

2. TEST SETUP.

a. Connect the Digital Reciprocal Counter to the rear panel ØA OUTPUT terminals.

3. CHECK.

a. Set the VERNIER control to the CAL position.

b. Set the front panel frequency selector switches and the DECADE switch to the settings given in table 5-1.

c. Record the output frequency reading for each setting.

TABLE 5-1. FREQUENCY TRACKING SETTINGS.

FREQUENCY SETTING	0.1% MEASUREMENT RANGE (HERTZ)	RECORDED READING
25·000	24.975 to 25.025	
100·00	99.900 to 100.10	
1000·0	999.00 to 1001.0	

d. The decade frequency readings should be within ±0.1% of the front panel settings.

e. If each of the frequency readings are within ±0.1% of the decade settings but are ALL higher or lower than the nominal fre-

quency settings it will be necessary to calibrate the VERNIER frequency control setting as described in paragraph 5-19.

f. If one or more but not all of the frequency readings exceed the nominal settings by more than ±0.1%, perform the frequency calibration procedure given in paragraph 5-20.

5-19. VERNIER FREQUENCY CONTROL CALIBRATION. If the measurements performed in paragraph 5-18 determine that ALL of the frequency settings exceeded the specification (±0.1%) it will be necessary to calibrate the VERNIER frequency control as follows:

1. TEST EQUIPMENT.

a. Digital Reciprocal Counter.

2. TEST SETUP.

a. Connect the Digital Reciprocal Counter to the rear panel ØA OUTPUT terminals.

3. CALIBRATION.

a. Set the VERNIER frequency control to the position where ALL of the frequency readings (refer to table 5-1) are within ±0.1% of the nominal settings.

NOTE

If the VERNIER frequency control cannot be set so that all three DECADE ranges are within ±0.1% of the front panel setting, set the VERNIER control for exactly 1,000 Hertz and proceed with the frequency calibration procedure given in paragraph 5-20.

b. Loosen the two set screws on the VERNIER frequency control knob taking care not to rotate or move the shaft from the optimized setting of step a.

c. When the set screws are loose, rotate the knob until the index mark lines up with the CAL index line on the front panel.

d. Tighten the set screws.

e. Recheck the three frequency settings to verify that the VERNIER control knob was not moved during the calibration adjustment and the readings are still within ±0.1% of the nominal frequency settings with the VERNIER knob set to the CAL position.

5-20. FREQUENCY CALIBRATION. The following steps calibrate the output frequency of the Oscillator for the three decade frequency ranges.

1. TEST EQUIPMENT.

a. Digital Reciprocal Counter.

2. TEST SETUP.

a. Connect the Digital Reciprocal Counter to the rear panel ØA OUTPUT terminals.

b. Set the VERNIER control to the CAL position.

3. CHECK 25 HERTZ.

a. Set the frequency and DECADE switches to 25·000 Hertz.

b. The output frequency reading should be between 24.975 and 25.025 Hertz.

4. CALIBRATION.

a. If not, adjust A1R54 (rear panel 25 Hz) until the frequency reading is exactly 25.000 Hertz.

5. CHECK 100 HERTZ.

a. Set the frequency and DECADE switches for 100·00 Hertz.

b. The output frequency reading should be between 99.900 and 100.100 Hertz.

6. CALIBRATION.

a. If not, adjust A1R55 (rear panel 100 Hz) until the frequency reading is exactly 100.00 Hertz.

7. CHECK 1 KILOHERTZ.

a. Set the frequency and DECADE range switches for 1000·0 Hertz.

b. The output frequency reading should be between 999.00 and 1001.00 Hertz.

8. CALIBRATION.

a. If not, adjust A1R56 (rear panel 1000 Hz) until the frequency reading is exactly 1000.0 Hertz.

NOTE

Frequency calibration capacitor A1A1C5 is only used on Oscillators which have a 100 kilohertz frequency range and does not require calibration on the AC-160.

9. Disconnect the Digital Reciprocal Counter.

5-21. CALIBRATE ØA OUTPUT AMPLITUDE. The following steps calibrate the output amplitude of the voltage vector output (ØA).

1. TEST EQUIPMENT.

a. Precision AC Voltmeter.

2. TEST SETUP.

a. Connect the Precision AC Voltmeter to the rear panel ØA OUTPUT terminals.

b. Set the frequency selector and DECADE switches to (10)00.0 Hertz.

3. CHECK.

a. The output amplitude should be between 2.4988 and 2.5013 volts rms.

4. CALIBRATION.

a. If not, adjust A1R101 (rear panel ØA AMPLITUDE) for exactly 2.5000 volts rms.

5. Disconnect the Precision AC Voltmeter.

5-22. QUADRATURE AMPLITUDE CALIBRATION. The following steps calibrate the quadrature phase (ØB) amplitude control circuit.

1. TEST EQUIPMENT.

a. Distortion Analyzer.

b. Precision AC Voltmeter.

2. CALIBRATE DRIVE BAL.

a. Connect the Distortion Analyzer to the rear panel ØB OUTPUT terminals.

b. Set the frequency and DECADE switches to 100·00 Hertz.

c. Set the LEAD-LAG switch to LEAD and the POWER FACTOR switch to 0.

d. Adjust A1A2R4 for minimum distortion.

e. Disconnect the Distortion Analyzer.

3. CHECK ØB AMPLITUDE.

a. Set the frequency and DECADE switches to 100·00 Hertz.

b. Set the LEAD-LAG switch to LEAD and the POWER FACTOR switch to 0.

c. Connect the Precision AC Voltmeter to the rear panel ØB OUTPUT terminals.

d. The amplitude should be between 2.4988 and 2.5013 volts rms.

4. CALIBRATION.

a. If not, adjust A1A2R28 for exactly 2.5000 volts rms.

5. Disconnect the Precision AC Voltmeter.

5-23. VARIABLE PHASE AMPLITUDE FLATNESS CALIBRATION. The following steps calibrate the DC balance and variable phase amplitude flatness.

1. TEST EQUIPMENT.

a. Precision AC Voltmeter.

b. DC Voltmeter.

2. CHECK DC BALANCE.

a. Connect the DC Voltmeter to the rear panel ØB OUTPUT

terminals.

b. Set the POWER FACTOR switch to VARIABLE.

c. The DC level should be less than ±10 millivolts.

3. CALIBRATION.

a. If not, adjust A1A3R3 for 0 volt.

4. CHECK AMPLITUDE FLATNESS.

a. Connect the Precision AC Voltmeter to the rear panel ØB OUTPUT terminals.

b. Set the POWER FACTOR switch to VARIABLE.

c. Measure and record the amplitude.

d. Adjust the 0-90° potentiometer throughout its full range while observing the Precision AC Voltmeter.

e. The output amplitude should not vary by more than ±2.0% from the reading recorded in step c.

5. CALIBRATION.

a. If it does, adjust A1A3R4 so that the 0-90° potentiometer can be adjusted through its full range while holding the output amplitude within ±2.0% of the reading recorded in step 4d.

6. Disconnect the Precision AC Voltmeter.

5-24. The above steps complete the calibration of the Oscillator. Disconnect the AC power cord and replace the bottom cover. Install the Oscillator in the mounting cabinet (if supplied).

5-25. POWER AMPLIFIER CALIBRATION PROCEDURE.

5-26. GENERAL. The following procedures calibrate the Voltage and Current Amplifiers. These calibration steps should not be performed unless the Oscillator has been properly calibrated using the procedures given above.

5-27. INITIAL TEST SETUP. The following steps describe the initial

setup to be made before proceeding with the calibration of the Voltage and Current Amplifiers.

1. With the two amplifiers removed from the mounting cabinet, remove both top covers.

2. Connect the interconnecting cables between the Voltage and Current Amplifiers and the AC-160 system.

3. Set the Current and Voltage Ratio Transformer switches to all zeroes.

4. Set the VOLTAGE OUTPUT switch to OFF.

5. Set the Oscillator frequency and DECADE switches to 100·00 Hertz. Set the POWER FACTOR switch to 1.0.

6. Connect the Autotransformer to a 115 volts AC power source and set the power switch to ON.

7. Connect the AC power cord from the Switch Panel to the Autotransformer. Set the MASTER POWER switch to ON.

8. Allow the AC-160 system to warm up for 1½ hours at 25°C, ±5°C, prior to making any calibration measurements or adjustments.

5-28. VOLTAGE AMPLIFIER CALIBRATION.

5-29. DC BALANCE ADJUSTMENT. The following steps check the DC balance of the Voltage Amplifier.

1. TEST SETUP.

   a. Set the metering switch to DC BAL.

2. CHECK.

   a. The RMS VOLTS meter should read zero.

3. If not, adjust A5R135 (front panel recessed DC BAL ADJ) for a zero reading on the RMS VOLTS meter.

5-30. QUIESCENT COLLECTOR CURRENT ADJUSTMENT. The following steps check the quiescent collector current of the output transistors.

1. TEST SETUP.

   a. Set the metering switch to Ic TEST.

b. Set the frequency and DECADE switches to 1000·0 Hertz.

2. CHECK.

a. The RMS VOLTS meter should read within the Ic band.

3. CALIBRATION.

a. If not, adjust A5R112 until the RMS VOLTS meter reads in the center of the Ic test band.

5-31. GAIN AND METER CALIBRATION. The following steps calibrate the voltage gain and RMS VOLTS meter of the Voltage Amplifier.

1. TEST EQUIPMENT.

a. Precision AC Voltmeter.

2. TEST SETUP.

a. Connect the Precision AC Voltmeter to the Voltage Ratio Transformer rear panel OUTPUT VOLTAGE terminals.

b. Set the OUTPUT VOLTAGE switches to (10)0·000 volts.

c. Set the VOLTAGE OUTPUT switch to X1.

d. Set the frequency and DECADE switches to 100·00 Hertz.

3. CHECK X1 GAIN CALIBRATION.

a. The Precision AC Voltmeter should read between 99.95 and 100.05 volts rms.

4. CALIBRATION.

a. If not, adjust A5R101 (rear panel GAIN CAL) for exactly 100.00 volts rms.

5. CHECK METER CALIBRATION.

a. The front panel RMS VOLTS meter should read 100.0 volts.

6. CALIBRATION.

a. If not, adjust A5R132 for a reading of exactly 100.0 volts

on the RMS VOLTS meter.

7. CHECK X10 GAIN CALIBRATION.

a. Set the VOLTAGE OUTPUT switch to OFF.

b. Set the OUTPUT VOLTAGE switches to 60·000.

c. Set the VOLTAGE OUTPUT switch to X10.

d. The Precision AC Voltmeter should read between 599.7 and 600.3 volts rms.

NOTE

If the X10 gain calibration check exceeds specification it will be necessary to remove the Voltage Ratio Transformer from the mounting cabinet and remove the bottom cover for access to the X10 gain adjustment.

WARNING

Up to 1,000 volts rms which is hazardous to life may be present in the Voltage Ratio Transformer. Use extreme caution when making the X10 gain adjustment.

8. CALIBRATION.

a. If not, adjust A2R11 (in the Voltage Ratio Transformer) for exactly 600.0 volts rms.

5-32. LOAD REGULATION ADJUSTMENT. The following steps calibrate the load regulation for a no load to full load condition at the output terminals for general applications. If it is desired to set the load regulation adjustment for a particular load at the end of the load leads refer to paragraph 3-36.

1. TEST EQUIPMENT.

a. Precision AC Voltmeter.

b. 220 Ohm Load Resistor, 100 Watts.

2. TEST SETUP.

a. Connect the Load Resistor across the Voltage Ratio Transformer OUTPUT VOLTAGE terminals.

b. Connect the Precision AC Voltmeter across the Load Resistor.

3. CALIBRATION.

a. Set the VOLTAGE OUTPUT switch to OFF and the OUTPUT VOLTAGE switches to (10)0·000.

b. With the Load Resistor disconnected, set the VOLTAGE OUTPUT switch to X1 and record the exact voltage reading on the Precision AC Voltmeter.

c. Set the VOLTAGE OUTPUT switch to OFF and connect the Load Resistor across the OUTPUT VOLTAGE terminals.

d. Set the VOLTAGE OUTPUT switch to X1 and adjust the LOAD REG potentiometer until the AC voltage is the same as recorded in step b.

e. Repeat steps b, c and d until the voltage does not change from no load to full load.

f. Set the VOLTAGE OUTPUT switch to OFF and return the OUTPUT VOLTAGE switches to all zeroes.

g. Disconnect the Precision AC Voltmeter and Load Resistor.

5-33. The above steps complete the calibration of the Voltage Amplifer. Replace the top cover on the amplifier and bottom cover of the Voltage Ratio Transformer if removed.

5-34. CURRENT AMPLIFIER CALIBRATION.

5-35. DC BALANCE ADJUSTMENT. The following steps check the DC balance of the Current Amplifier.

1. TEST SETUP.

a. Connect the 0.2 ohm, 50 watt load resistor across the rear panel OUTPUT I terminals.

b. Set the metering switch to DC BAL.

2. CHECK.

a. The RMS AMPERES meter should read at zero.

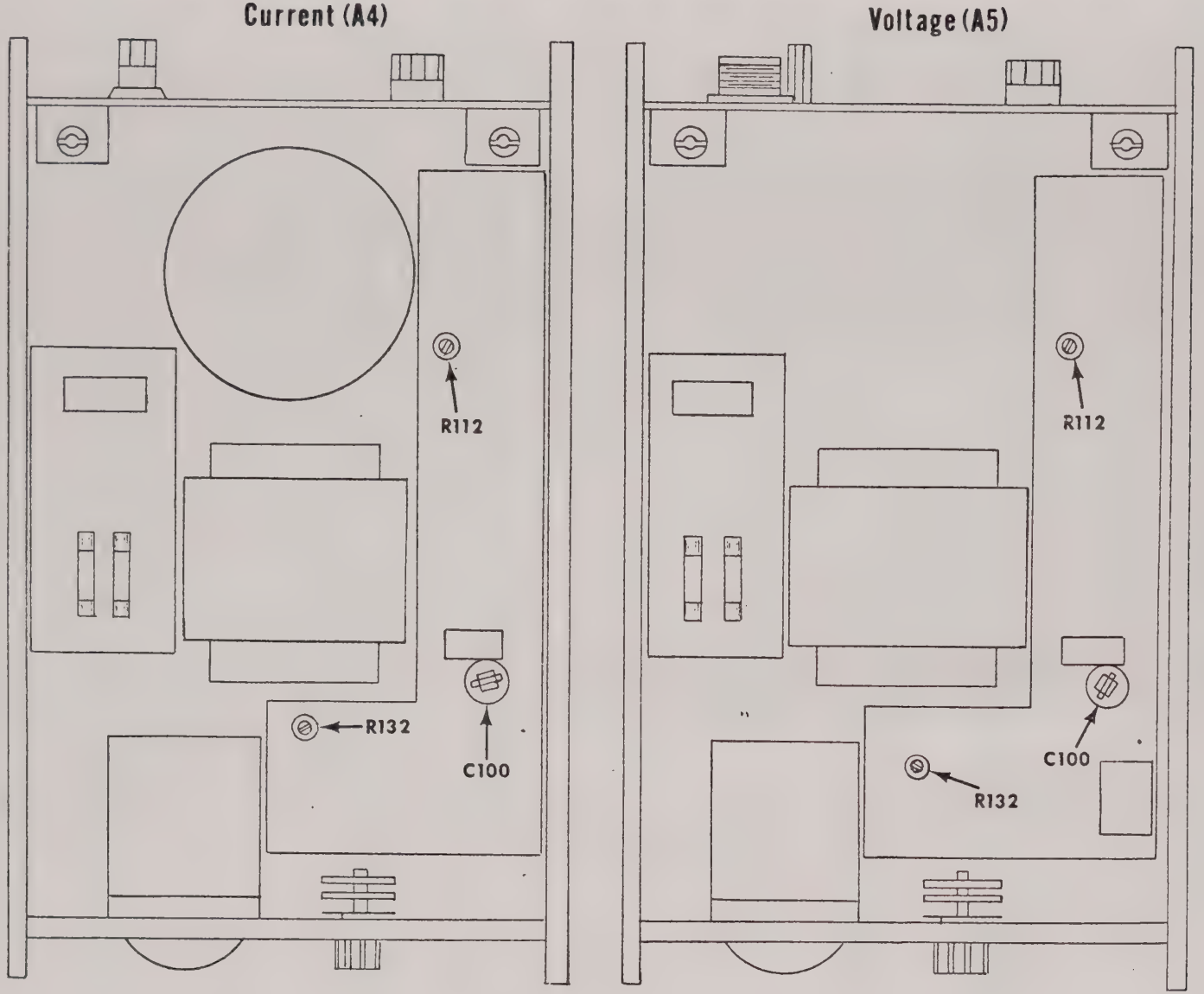

Figure 5-2 Amplifier Adjustments

3. CALIBRATION.

a. If not, adjust A4R135 (front panel recessed DC BAL ADJ) for a zero reading on the RMS AMPERES meter.

4. Disconnect the Load Resistor.

5-36. QUIESCENT COLLECTOR CURRENT ADJUSTMENT. The following steps check the quiescent collector current of the output transistors for a no load condition.

1. TEST SETUP.

a. Place a short across the OUTPUT I terminals on the rear panel.

b. Set the metering switch to Ic TEST.

c. Set the frequency and DECADE switches to 100·0 Hertz.

2. CHECK.

a. The RMS AMPERES meter should read within the Ic band.

3. CALIBRATION.

a. If not, adjust A4R112 until the RMS AMPERES meter reads in the center of the Ic test band.

5-37. GAIN AND METER CALIBRATION. The following steps calibrate the current gain and meter of the Current Amplifier.

1. TEST EQUIPMENT.

a. Precision Ammeter.

2. TEST SETUP.

a. Connect a Precision AC Ammeter in series with the OUTPUT I terminals.

b. Set the OUTPUT CURRENT switches to (10)·0000 amperes.

c. Set the frequency and DECADE switches to 100·00 Hertz.

3. CHECK GAIN.

a. The Precision AC Ammeter should read between 9.995 and 10.005 amperes.

4. CALIBRATION.

a. If not, adjust A4R101 (rear panel GAIN CAL) for exactly 10.000 amperes rms.

5. CHECK METER CALIBRATION.

a. Set the metering switch to OUTPUT I.

b. The front panel RMS AMPERES meter should read 10.0 amperes.

6. CALIBRATION.

a. If not, adjust A4R132 for a reading of exactly 10.0 amperes on the RMS AMPERES meter.

7. Set the OUTPUT CURRENT switches to all zeroes and disconnect the AC Ammeter.

5-38. LOAD REGULATION ADJUSTMENT. The following steps calibrate the load regulation for a short circuit (no load) to full load at the output terminals for general applications. If it is desired to set the load regulation adjustment for a particular load at the end of the load leads refer to paragraph 3-35.

1. TEST EQUIPMENT.

a. Precision AC Ammeter.

b. 0.45 Ohm Load Resistor, 100 Watts.

2. TEST SETUP.

a. Connect the Load Resistor and Precision AC Ammeter is series with the OUTPUT I rear panel terminals.

3. CALIBRATION.

a. Set the OUTPUT CURRENT switches to all zeroes and the VOLTAGE OUTPUT switch to OFF.

b. Set the LOAD REG potentiometer fully counterclockwise.

c. Short the Load Resistor. Set the VARIABLE OUTPUT poten-

tiometer fully clockwise and depress the VARIABLE OUTPUT switch.

d. Record the reading on the Precision AC Ammeter.

e. Remove the short from across the Load Resistor and adjust the LOAD REG potentiometer until the Precision AC Ammeter reading is the same as recorded in step d.

f. Repeat steps c, d and e until the current reading does not change when the load is shorted.

g. Release the VARIABLE OUTPUT switch and set the VARIABLE OUTPUT potentiometer fully counterclockwise.

4. Disconnect the Precision AC Ammeter and Load Resistor.

5-39. The above steps complete the calibration of the Current Amplifier and the AC-160 system. Replace the top cover and install the amplifiers in the mounting cabinet.

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